Closure Report
For the UST Site 33 (Fuel Purge Area)
Tinker Air Force Base, Oklahoma

Facility Number 55-08120
Case Number 064-1105

Contract F34650-93-D-0106
Delivery Order 5017

Department of the Air Force
Oklahoma City Air Logistics Center
Tinker Air Force Base

December 1999

CLOSURE REPORT

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Facility Number 55-08120

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Prepared for

DEPARTMENT OF THE AIR FORCE
OKLAHOMA AIR LOGISTICS CENTER
TINKER AIR FORCE BASE

Prepared by

PARSONS ENGINEERING SCIENCE, INC.

MIDWEST CITY, OKLAHOMA

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ACRONYMS AND ABBREVIATIONS

AFB	Air Force Base
AFCEE	Air Force Center for Environmental Excellence
A.L. Burke	A.L. Burke Engineers, Inc.
ASTM	American Society for Testing and Materials
bgs	below ground surface
BTEX	Benzene, toluene, ethylbenzene, xylene
COC	Chemicals of concern
°F	degrees Fahrenheit
DD	Decision document
DRO	Diesel range organics
ERPIMS	Environmental Resources Program Information Management System
FPA	Fuel Purge Area
GRO	Gasoline range organics
GWMU	Groundwater Management Unit
HSZ	Hennessey saturated zone
IRP	Installation Restoration Program
ISC	Initial site characterization
ISGC	Investigation for soil and groundwater cleanup
IT	IT Corporation
LSZ	Lower saturated zone
msl	mean sea level
OAC	Oklahoma Administrative Code
OCC	Oklahoma Corporation Commission
ODEQ	Oklahoma Department of Environmental Quality
ORBCA	Oklahoma Risk-Based Corrective Action
Parsons ES	Parsons Engineering Science
PZ	Producing zone
RBCA	Risk based corrective action
RBSLs	Risk based screening levels
RCRA	Resource Conservation and Recovery Act
TPH	Total petroleum hydrocarbons
USDA	United States Department of Agriculture
UST's	Underground storage tanks
USZ	Upper saturated zone
WFDS	Waste Fuel Dump Site
Woodward Clyde	Woodward Clyde Federal Services

1.1.2 Nearby Population

The residential area nearest this site is located off-base approximately 3,500 feet east. This area is a low-density development of Oklahoma City. The nearest on-base residential population, consisting of Air Force personnel, is located in the base housing facilities approximately 2 miles northwest of the site. The base has 7 dormitories and 730 family housing units. The nearest on-base work population occupies Building 2111. On-base workers occupy numerous buildings surrounding the site.

1.1.3 Surface and Groundwater Resources

Tinker AFB is located within the Central Redbed Plains section of the Central Lowland Physiographic Province. Oklahoma County elevations range from about 850 feet to 1,400 feet above mean sea level (msl). The topography is characterized by near level to gently rolling hills, broad flat plains and well-entrenched main streams. Secondary stream valleys may exhibit a sag and swale appearance that indicates the erosion of residual soil. The ground surface at Tinker AFB varies in elevation from approximately 1,320 feet msl in the southeastern portion of the base to 1,190 feet msl in the northwestern portion of the base. Local relief is primarily the result of dissection by erosional activity and/or stream channel development (Parsons ES, 1999).

The surface drainage on Tinker AFB is accomplished by overland flow of runoff to diversion structures, which then flows to area surface streams. Figure 1.3 shows the surface water drainage paths at Tinker AFB. Surface hydrology for Tinker AFB is dominated by Crutcho Creek, Kuhlman Creek, Soldier Creek and Elm Creek. Both Soldier Creek and Crutcho Creek are perennial streams. Soldier Creek, which would be intermittent at the base under natural conditions, is perennial due to discharges from the drainage feature and cooling towers associated with Building 3001. Soldier Creek flows into Crutcho Creek, which discharges into the North Canadian River located approximately 6 miles north of Tinker AFB. Crutcho Creek and a tributary, Kuhlman Creek, drain most of the base. The northeastern portion of the base is drained by Soldier Creek, and the extreme southeastern portion of the base is drained by Elm Creek. Elm Creek and one small unnamed stream cross installation boundaries south of the main

instrument runway. Generally, they do not receive significant quantities of base runoff due to site grading that is designed to preclude such drainage. Elm Creek discharges into the Stanley Draper Lake, which is located less than 1 mile south of the southeastern border of the base (Parsons ES, 1999).

An important source of potable groundwater in the Oklahoma City metropolitan area is the central Oklahoma aquifer system. This aquifer extends under much of central Oklahoma and includes water in the Garber Sandstone and Wellington Formation. The Garber Sandstone and the Wellington Formation portions of the central Oklahoma aquifer system are commonly referred to as the "Garber-Wellington aquifer" and are considered to be a single aquifer because these units were deposited under similar conditions. The nearby communities of Midwest City and Del City derive their water supplies from surface sources, but have wells using the aquifer in the event of an emergency. Industrial operations, individual homes, farm irrigation and small communities not served by municipal distribution systems depend on the Garber-Wellington aquifer. Several communities whose primary water source is surface water, such as Oklahoma City, maintain well systems drilled into the Garber-Wellington as standby sources of water in the event of drought (Parsons ES, 1999).

Tinker AFB lies within the limits of the Garber-Wellington groundwater basin. At the present time, Tinker AFB derives most of its water supply from this aquifer and supplements the supply by purchasing from the Oklahoma City Water Department. Six Tinker AFB water supply wells are located within one-half mile of the site. The closest Tinker AFB water supply well to the site is located approximately 400 feet to the northeast. There are no private water supply wells within one-half mile of the site.

1.2 SITE HISTORY AND ENFORCEMENT ACTIVITIES

1.2.1 History

The original FPA was in operation from 1975 through 1990. Waste fuels (JP4 and JP5) were drained from aircraft in the maintenance facility and transported by truck to the FPA for disposal. Allegedly, numerous spills occurred during this period in the area. The

original facility consisted of a 6-foot by 8-foot by-2 foot deep metal bunker located on bare soil at the west edge of a 60 foot by 80 foot asphalt pad. The bunker was elevated 1.5 feet above the surface on metal posts. It was equipped with a steel ramp to accommodate the trucks that were emptied via hoses. The bunker was connected by a steel pipeline to 2 above ground waste fuel holding tanks, that rested on bare soil approximately 310 feet south of the metal bunker. Fuel dumped in the metal bunker would gravity drain to the holding tanks. Approximately one-third of the connecting pipeline was buried. A second group of aboveground waste fuel holding tanks were located approximately 100 feet southeast of the described waste fuel holding tanks. Both groups of tanks were inside spill-containment berms to mitigate any spills.

This facility was modified in 1990. The existing equipment was dismantled and the asphalt defueling pad was replaced with a concrete pad. A new bunker with spill-containment protection was installed on the east side of this pad. An above ground pipeline connecting the new bunker with the holding tanks was constructed approximately 50 feet east of the original pipeline. In January 1995, a 15,000-gallon UST was installed just east of the new defueling pad. The UST (# 2211) replaced the 2 aboveground waste fuel holding tanks located south of the facility which were formerly used to hold off-loaded fuel products. The 2 aboveground waste fuel holding tanks and their associated piping were dismantled and removed in late 1995. The berm areas for the aboveground waste holding tanks are still present but serve no current purpose since the tanks have been removed.

The area designated as UST Site 33 was originally identified during investigations of underground storage tanks in 1986 (A.L Burke, 1986). UST Site 33 was one of 37 UST sites that were identified for further evaluation (Parsons ES, 1993). As discussed in Section 1.1, the site consists of USTs 2114 (JP-8) and 2115 (JP-5). These tanks have a 26,000-gallon capacity and are located at Building 2111. Two fuel hydrants are located 50 feet south of the tarmac apron, northwest of the FPA defueling pad. The hydrants are connected via underground east-west pipelines to USTS 2114 and 2115.

A drainage sump, tank 2117, collected spilled fluids (waste jet fuel and runoff water) from these USTs via gravity drain lines. Tank 2117 was a 2,500-gallon steel tank. This tank was removed and replaced with a vaulted, steel tank in December 1994. The replacement tank, 2117R, was installed south of the former tank location. Figure 1.2 shows the site location and surrounding buildings. .

1.2.2 Investigation Activities

The FPA was originally investigated in 1990 under the regulatory authority of the OCC. Several investigations of the site followed through 1993. The site was later investigated as a Resource Conservation and Recovery Act (RCRA) facility in 1993. Two additional site investigations were conducted in 1994 and in 1996.

Following OCC case activation, an Initial Site Characterization (ISC) was conducted in 1994 in the vicinity of tanks 2114, 2115 and 2117. Four borings were completed as part of the ISC. Fourteen borings and three monitoring wells were completed in 1995 as part of the Investigation for Soil and Groundwater Cleanup (ISGC) report.

In August 1996, OC-ALC/EMR Tinker AFB petitioned OCC to consolidate Site 33 and the remainder of the FPA into a single regulatory unit for soil remediation and closure. Tinker AFB requested broadened regulatory oversight by OCC for the soil contamination and also requested that groundwater regulation for this same area be released from OCC primary oversight and transferred to Oklahoma Department of Environmental Quality (ODEQ) primary oversight. A detailed site layout and history of the site can be found in the ORBCA Summary Report for the site (Parsons ES, 1997).

In accordance with OAC 165:25-3-74, an ORBCA Tier 1/1A review of the site was performed in 1997 (Parsons ES, 1997). ORBCA assessments are conducted in conformance with the American Society for Testing and Materials (ASTM) Method E1739 for Risk Based Corrective Action (RBCA). The investigation of the soil and groundwater at the site in 1997 indicated that subsurface contamination was below laboratory detection limits or did not exceed the Tier 1/1A levels for fuel compounds regulated by the OCC.

The ORBCA Report recommended closure of the site in accordance with Tier 1/1A closure guidelines.

However, due to the suspected presence of free product in the soil, a bioventing remedial action was started at the site in the summer of 1997. The bioventing system comprised of 7 air injection vent wells was designed to remediate the contaminated soil within the source areas.

1.2.3 Regulatory Agency Activities

Following review of the Fuel Purge Area ORBCA Report (Parsons ES, 1997) and the annual monitoring report (Parson ES, 1999c) the OCC concluded that no further action was required and closed the case on October 13, 1999, in accordance with OAC 165:25-3-79. In summary, all OCC comments and requirements were implemented or fulfilled for this site.

The groundwater regulation for the site was released from OCC primary oversight and transferred to ODEQ primary oversight. Presently, the groundwater beneath the FPA is within an Installation Restoration Program (IRP) groundwater management unit (GWMU) at Tinker AFB. The GWMU is managed in conformance with RCRA requirements. As such, the groundwater beneath the site is still regulated by the ODEQ.

1.3 COMMUNITY PARTICIPATION

There has been no community involvement in the ORBCA investigation conducted at the FPA at Tinker AFB, Oklahoma.

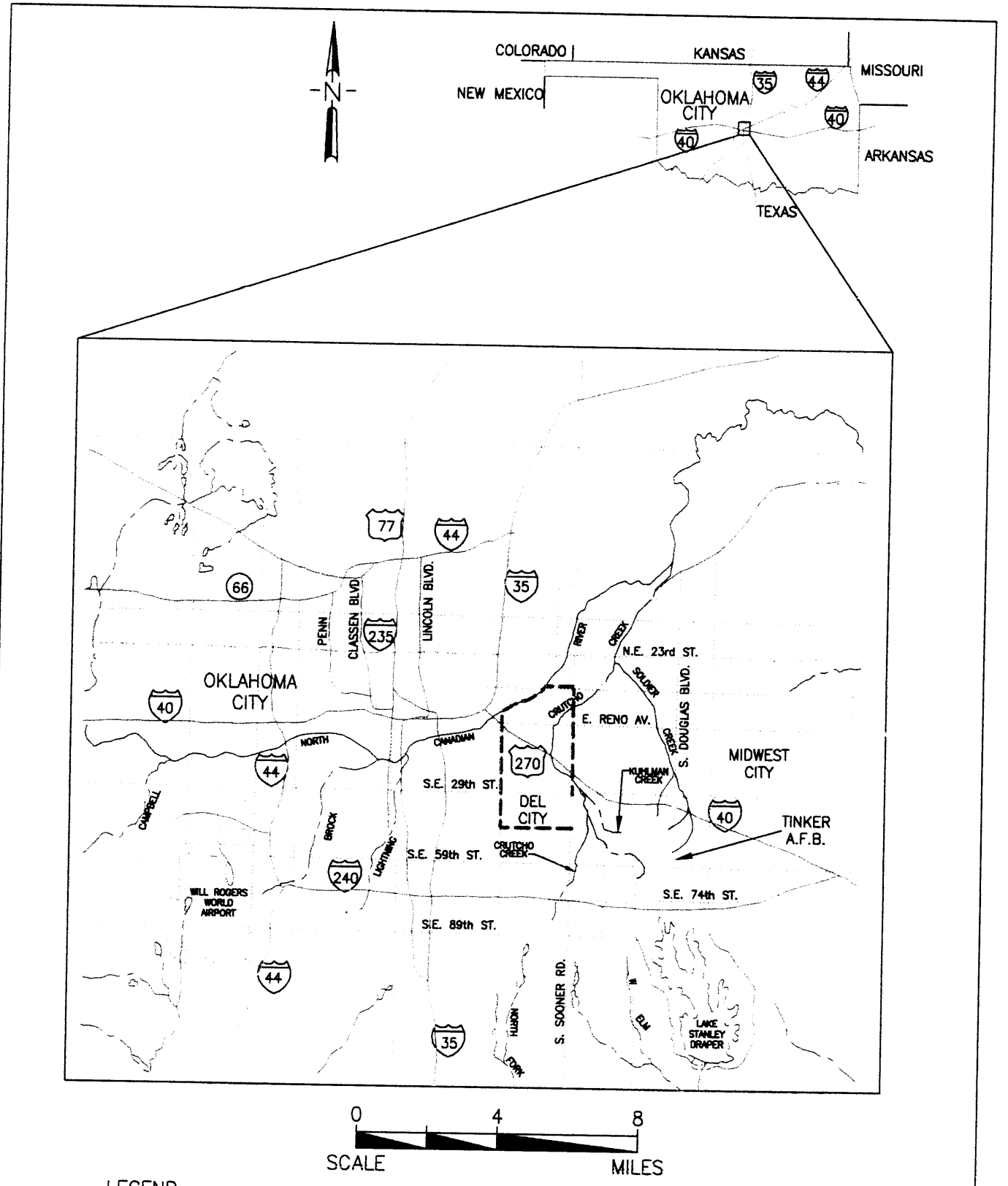
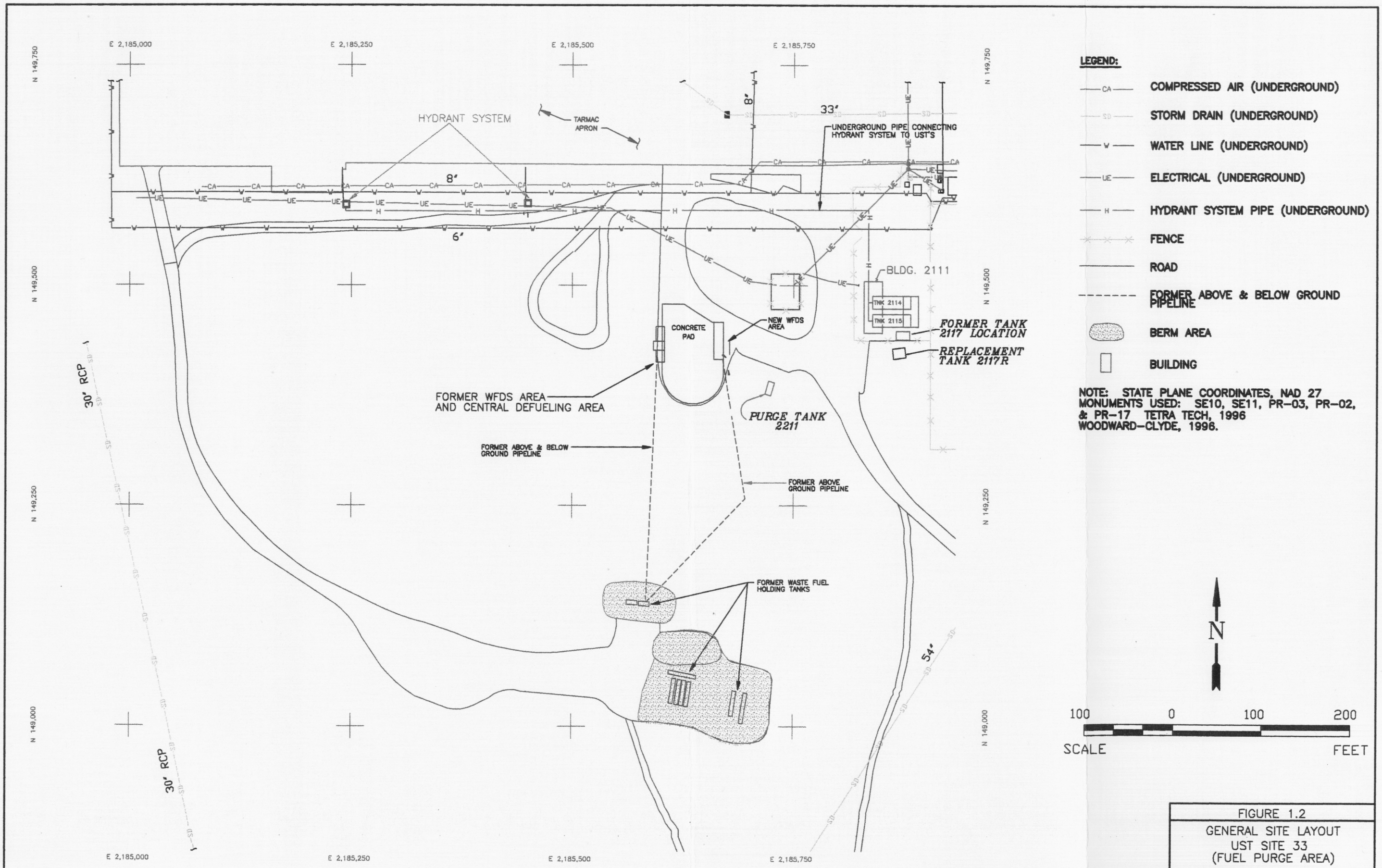


FIGURE 1.1

TINKER AIR FORCE BASE
LOCATION MAP

TINKER A.F.B., OKLAHOMA

C:_jobs\729906\Fig 1-1



REFERENCE: WOODWARD-CLYDE (1996)

FIGURE 1.2
GENERAL SITE LAYOUT
UST SITE 33
(FUEL PURGE AREA)
TINKER AFB, OKLAHOMA

729906-33 Fig 1-2.DWG

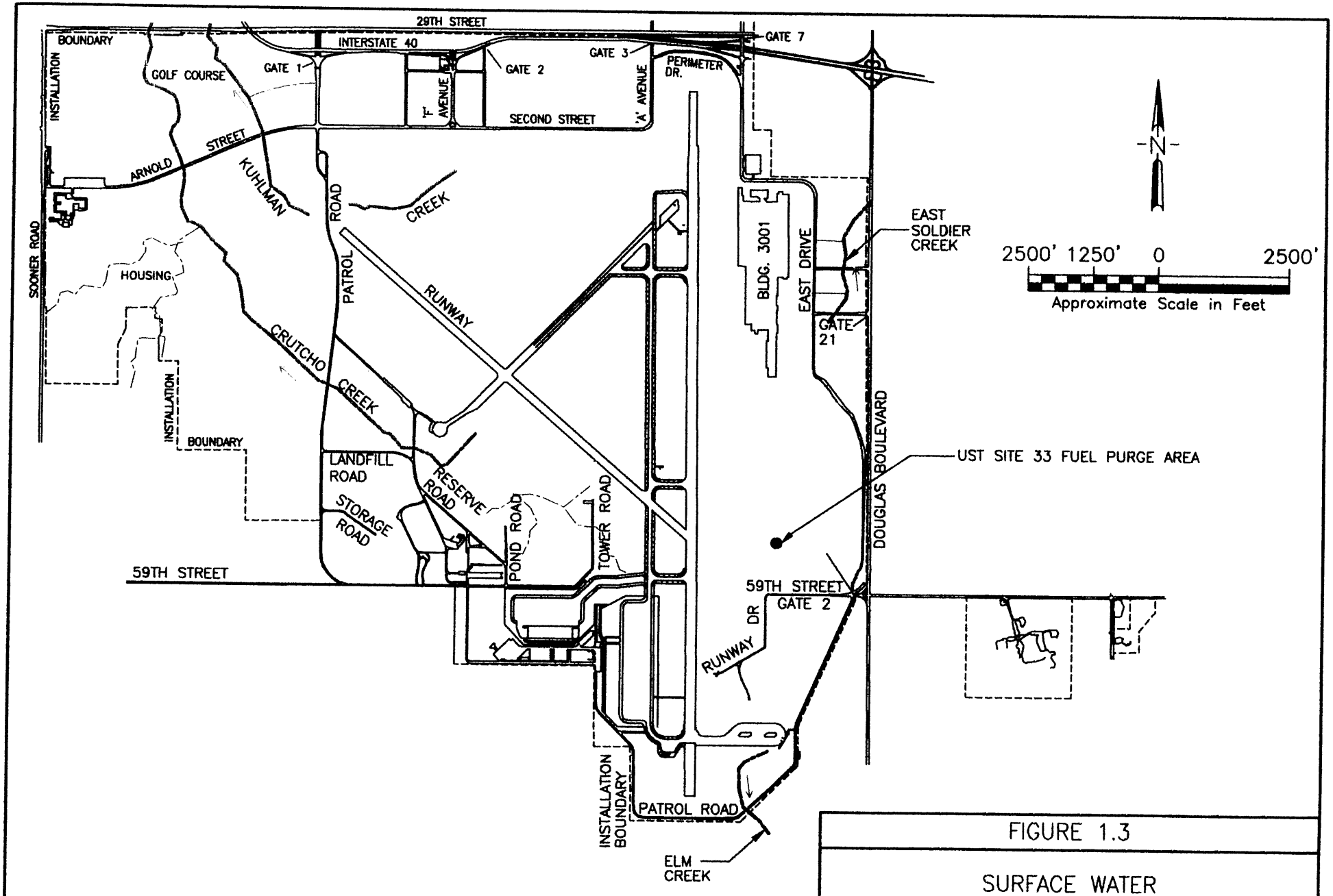


FIGURE 1.3

SURFACE WATER
DRAINAGE PATHS

TINKER A.F.B., OKLAHOMA

c:\729906\729906-33 Fig 1-3.DWG

SECTION 2

CURRENT SITE STATUS

2.1 CLIMATOLOGY

The climate at Tinker AFB is characterized by long hot summers, occasional droughts of varying duration occur and, comparatively, mild winters. During the summer months, average daily temperatures range from approximately 66 to 94 degrees Fahrenheit (°F). During the winter months, average daily temperatures range from approximately 26 to 54°F. Maximum precipitation generally occurs in May, and the average annual precipitation for the region is 40.45 inches. The average evaporation rate is approximately 50 inches. The prevailing wind direction is southerly. However, northerly and southerly winds occur with about equal frequency from December to March. The average monthly wind speed varies from 12 miles per hour in July and August to 16 miles per hour in March and April. Strong gusty winds occur with thunderstorms and low-pressure systems that migrate from west to east during winter and spring. Severe storms occur more frequently in the spring, but can occur in any month of the year (Parsons ES, 1999).

2.2 GEOLOGY AND SOIL

The surface soils of the installation area are of three predominant types: residual, alluvial, and urban land. The predominant soils are the Stephenville-Darsil, Renthen-Urban Land Complex, Kirkland-Urban Land Complex and Urban Land (USDA, 1996). The uppermost geologic units at Tinker AFB are composed of Quaternary alluvium and terrace deposits, the Hennessey Group and the Permian Garber-Wellington Formation. Quaternary alluvium, present along portions of Crutcho Creek and Soldier Creek, consists of unconsolidated interfingered lenses of sand, silt, clay and gravel. The terrace deposits, which were deposited by ancient streams, consist mostly of lenticular beds of sand, silt, clay and gravel (Parsons ES, 1999). The bedrock units are composed of a sequence of sandstones, siltstones and shales. These formations are about 900 feet thick.

In undisturbed areas of Site 33 and the FPA, clays and silty clays of the Hennessey Group are encountered from the surface to approximately 15 feet below ground surface (bgs). Below the clay and silty clay zone, a heterogeneous weathered bedrock zone occurs, which consists of siltstone, silty sandstone and shale. This interval extends to a depth of approximately 35 feet bgs and is the lowermost unit of the Hennessey Group. Below this formation are moderately well sorted reddish brown sands that form the Garber Sandstone. The silt content decreases and the grain size increases with depth in this region.

2.2.1 Soil Contamination

Based on analytical data collected from 90 borings drilled between 1992 and 1996, the maximum levels of the chemicals of concern (COCs) were benzene (0.017 mg/kg), toluene (0.18 mg/kg), ethylbenzene (2.3 mg/kg), xylenes (4.4 mg/kg) and naphthalene (3.8 mg/kg). This data was submitted to the Air Force Center for Environmental Excellence (AFCEE) under the Environmental Resources Program Information Management System (ERPIMS) data management program. The ERPIMS site identification code number is 133. Table 2-1 details the analytical results for the benzene, toluene, ethylbenzene, xylene (BTEX) and naphthalene compounds detected in the soil samples collected for analysis during the various investigations of the site. Maximum levels for various total petroleum hydrocarbon (TPH) ranges were: TPH/ gasoline range organics (GRO) (1,400 mg/kg) at 1.0-1.5 feet bgs near UST 2117; TPH/diesel range organics (DRO) (4,110 mg/kg) near the former asphalt pad at a depth of 1-2 feet bgs; TPH C9-C16 (1,070 mg/kg) at a depth of 11-11.5 feet bgs near UST 2117; and TPH C10-C18 (2,490 mg/kg) near the hydrant stand at a depth of 2-3 feet bgs. The highest undifferentiated TPH value was 22,000 mg/kg at a depth of 1.5 feet near the former asphalt pad. TPH analytical data summaries are presented in the ORBCA report for this site. The deepest occurrence of COCs was toluene at 0.005 mg/kg at 45 feet bgs in the saturated zone near UST 2117 (Parsons ES, 1997). Figure 2-1 illustrates the locations of all the soil borings at the FPA.

2.3 HYDROGEOLOGY

The groundwater conceptual model of Tinker AFB was formed by the integration of geologic and hydrologic data from across the base. The hydrogeologic system at Tinker AFB is complex, and the model provides both an approximation of depth to water and an estimated direction of groundwater movement (Parsons ES, 1999). The groundwater and hydrogeologic system in the vicinity of the FPA has been investigated and is evaluated as part of a basewide groundwater study by the IT Corporation (IT, 1999).

Approximately 1,150 groundwater monitoring wells were installed at the base during remedial investigations. The conceptual hydrologic model, based largely on data from these wells, divides the groundwater system under Tinker AFB into three principal aquifer zones: an upper saturated zone (USZ), a lower saturated zone (LSZ) and a producing zone (PZ). The PZ starts at an average depth of 200 or 250 feet bgs at Tinker AFB. In addition, a less extensive zone, the Hennessey saturated zone (HSZ), has also been identified above the USZ on a portion of the base. Numerous thin shallow saturated beds of siltstone and sandstone may exist within the HSZ throughout the base (Parsons ES, 1999).

The USZ and LSZ are recognized over the entire Base. The USZ exists mainly under water table (unconfined) conditions basewide, although subunits appear to be partially confined locally. The LSZ is unconfined on the east side of the base, but becomes confined west of Building 3001 and the North-South runway. The USZ and LSZ are separated by a low permeability shale interval of variable thickness. The shale interval acts as the lower confining bed for the USZ in the vicinity of the FPA (Woodward Clyde, 1996).

Regional groundwater flow in the USZ at the Fuel Purge Area is both to the west and the southwest. The average depth to groundwater is 42.3 feet bgs. Hydraulic conductivity in this unit has been measured at 1.1866 ft/day (Parsons 1997).

2.3.1 Groundwater Contamination

The uppermost aquifer, beneath the site, is designated by Tinker AFB as the USZ. The USZ occurs at a depth of approximately 42 feet bgs across the site. The USZ is separated from deeper zones by confining intervening shales, thus, contamination of deeper zone water supplies (deeper than 200 feet bgs) is not a likely threat. At the Fuel Purge Area there is a localized area where the USZ groundwater flow direction is northwest. However, regionally the USZ groundwater flows to the west-southwest.

As discussed in Section 1.2.2, groundwater in the area is being evaluated within a GWMU area regulated by ODEQ. Groundwater contamination in the USZ has multiple sources not associated with the FPA or UST Site 33. Since contaminates associated with this site are not found at depth in the unsaturated portion of the Hennessey Group or the Garber Formation, the soil to groundwater pathway was not considered. Therefore, groundwater is not covered by this closure report.

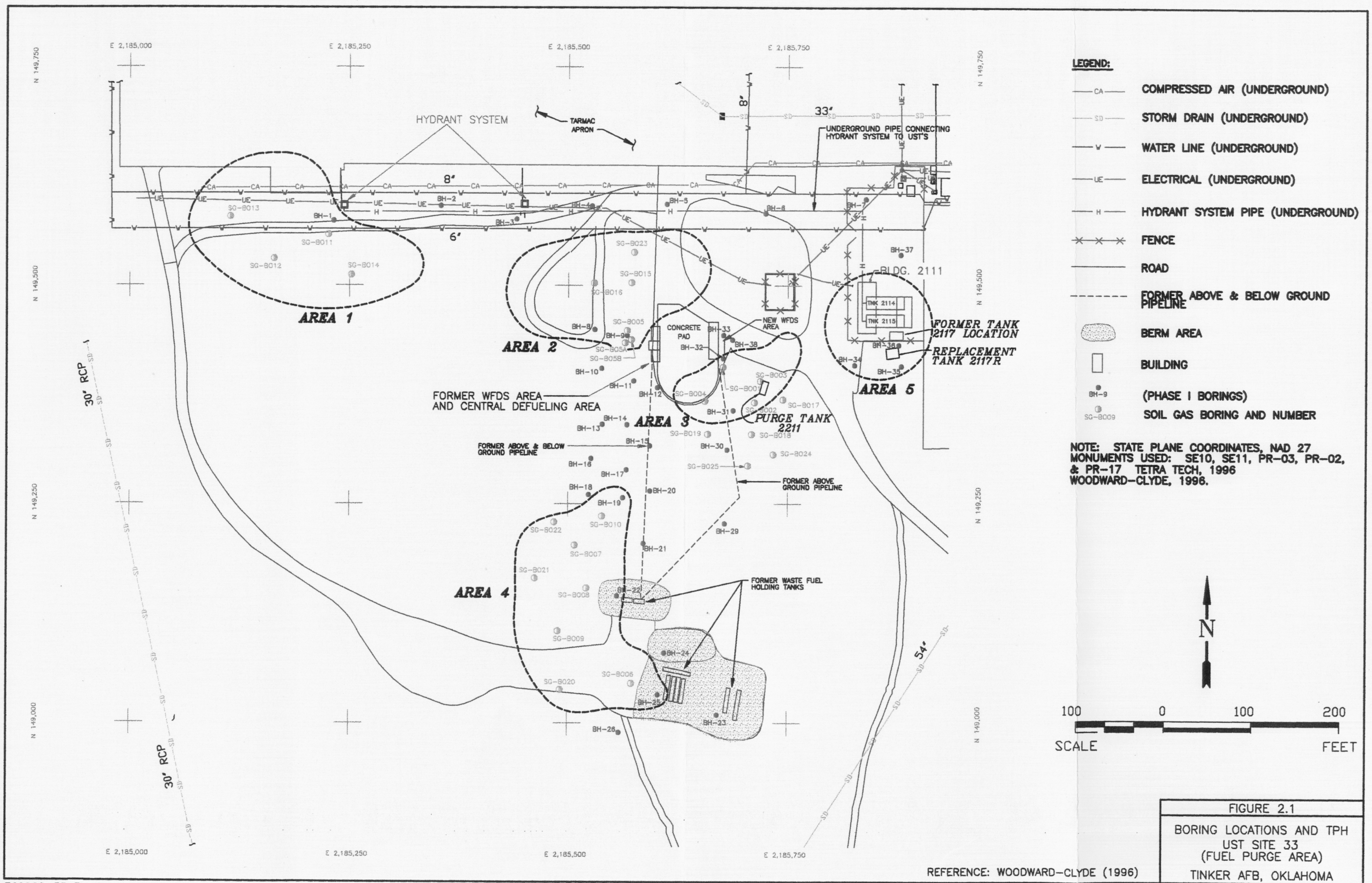
2.4 SURFACE WATER

Surface water at the Fuel Purge Area drains westward toward Crutcho Creek. The creek is approximately one mile from the site and has not been affected by the subject UST's. No surface water or sediment samples were collected as part of the Fuel Purge Area site investigations. However, Crutcho Creek sediment and surface samples are periodically collected (semi-annually) every year under a separate program.

2.5 RECEPTORS

Human receptors in the vicinity of the Fuel Purge Area are divided into two groups: on-base and off-base receptors. Base personnel reside in base housing located approximately 2 miles northwest of the site. The base dormitories are located within 2.5 miles of the site. The nearest commercial on-base workers occupy Building 2111. Construction workers may be on the site for utility line maintenance. There are six Tinker AFB water supply wells within a one-half mile radius of the Fuel Purge Area. The closest Tinker AFB water supply well to the site is located approximately 400 feet to the

northeast. The closest off-base residence is located 3,500 feet east of the site and the area is generally undeveloped. There are no private water supply wells within one-half mile of the site.



REFERENCE: WOODWARD-CLYDE (1996)

FIGURE 2.1

BORING LOCATIONS AND TPH
UST SITE 33
(FUEL PURGE AREA)
TINKER AFB, OKLAHOMA

729906-33 Fig 2.1

Table 2.1
Analytical Data Summary for Soil

MW No./Sample Location	Sampling Date	Sample Depth [ft.]	Benzene [mg/kg]	Toluene [mg/kg]	Ethylbenzene [mg/kg]	Xylene [mg/kg]	Naphthalene [mg/kg]
BO19-SS-001	1/1/1996	3.0-4.0	<0.006	0.0013	<0.006	<0.006	< 0.41
BO20-SS-001	1/1/1996	4.0-5.0	<0.006	0.0016	<0.006	<0.006	<0.39
BO21-SS-001	1/1/1996	2.0-3.0	<0.01	0.0014	<0.01	<0.01	<0.4
BO21-SS-003	1/1/1996	12.0-13.0	<0.006	0.0018	<0.006	<0.006	<0.37
BO23-SS-001	1/1/1996	3.0-4.0	<0.006	0.0014	<0.006	<0.006	NA
BO23-SS-002	1/1/1996	6.0-8.0	<0.006	0.0054	<0.006	<0.006	NA
BO24-SS-002	1/1/1996	7.0-8.0	<0.02	0.0037	<0.02	<0.02	<0.41
BO26-SS-005	1/1/1996	24.0-25.0	<0.005	0.005	<0.005	<0.006	NA
BO27-SS-004	1/1/1996	17.0-18.0	<0.006	<0.006	<0.006	0.0012	<0.38
BO27-SS-005	1/1/1996	24.0-25.0	<0.006	0.0012	<0.006	<0.006	<0.38
BO28-SS-001	1/1/1996	4.0-5.0	<0.006	0.0028	<0.006	<0.006	<0.41
BO29-SS-001	1/1/1996	3.0-4.0	<0.006	0.0022	<0.006	<0.006	NA
BO29-SS-002	1/1/1996	7.0-8.0	<0.006	0.0016	<0.006	<0.006	<0.39
BO29-SS-004	1/1/1996	15.0-16.0	<0.006	0.0013	<0.006	<0.006	NA
BO30-SS-001	1/1/1996	3.0-4.0	<0.006	0.004	<0.006	<0.006	NA
BW33-B5-12.5	9/1/1995	12.5-13.3	<0.001	0.0006	<0.001	<0.001	NA
BW33-B5-45.8	9/1/1995	45.8-46.5	<0.001	0.005	<0.001	<0.001	NA
BW33-B7-11.5	9/1/1995	11.5-12.0	<0.001	0.006	<0.001	<0.001	NA
BW33-B7-47	9/1/1995	47.0-47.5	<0.001	0.005	<0.001	<0.001	NA
BW33-B12A-2.5	9/1/1995	2.5-3.0	<0.125	<0.125	<0.125	0.263	NA
BW33-B12A-11	9/1/1995	11.0-11.5	<0.125	<0.125	<0.125	0.0898	NA
BW33-B13-1	9/1/1995	1.0-1.5	<0.125	<0.125	<0.125	1.87	NA
BO04-SS-002	12/1/1994	5.0-10.0	<0.006	0.0023	<0.006	<0.006	<0.4
BO07-SS-001	12/1/1994	0.0-5.0	<0.057	<0.057	0.027	0.081	1.6
BO07-SS-002	12/1/1994	5.0-10.0	<0.017	0.088	0.18	1	3.8
BO07-SS-003	12/1/1994	10.0-15.0	<0.006	0.18	1	3.8	<0.37
BO12-SS-002	12/1/1994	15.0-16.0	<5.6	<5.6	<5.6	4.4	<3.7
BO13-SS-002	12/1/1994	5.0-10.0	<0.006	0.0012	<0.006	<0.006	<0.39
BO18-SS-001	12/1/1994	0.0-5.0	<0.007	0.0015	<0.007	<0.007	<0.40

Table 2.1 (Continued)
Analytical Data Summary for Soil

MW No./Sample Location	Sampling Date	Sample Depth [ft.]	Benzene [mg/kg]	Toluene [mg/kg]	Ethylbenzene [mg/kg]	Xylene [mg/kg]	Naphthalene [mg/kg]
BH01-SS-001	1/1/1993	0.0-5.0	<0.006	<0.006	0.001	0.0052	NA
BH01-SS-002	1/1/1993	2.0-3.0	<0.006	<0.006	<0.006	0.019	NA
BH04-SS-002	1/1/1993	0.0-1.0	<0.006	0.0011	<0.006	<0.006	NA
BH09-SS-004	1/1/1993	13.0-14.0	0.017	<0.006	0.069	0.03	NA
BH09-SS-005	1/1/1993	10.0-15.0	<0.006	<0.006	0.014	0.063	NA
BH12-SS-001	1/1/1993	0.0-5.0	<0.064	<0.064	0.23	<0.064	NA
BH12-SS-002	1/1/1993	1.0-2.0	<0.064	<0.064	0.18	0.15	NA
BH37-SS-003	1/1/1993	5.0-10.0	<0.006	0.002	<0.006	<0.006	NA
FPA-B01-SS-1	9/23/1992	0.75-1.25	<0.005	0.098	0.11	0.25	<0.05
FPA-03-SS-2	9/11/1992	10-10.6	0.01	<0.005	0.12	<0.005	1.2
FPA-11-SS-3	9/15/1992	9-9.6	<0.005	<0.005	0.032	<0.005	<0.05
FPA-12-SS-2	9/15/1992	10-10.6	<0.005	<0.005	0.013	<0.005	<0.05
FPA-B31-SS-1	9/23/1992	2.5-3.5	<0.005	<0.005	1	2	<3.3
FPA-B31-SS-3	9/23/1992	8.0-9.0	<0.005	<0.005	0.3	1.2	2.6
FPA-B33-SS-3	9/23/1992	7.0-8.0	<0.005	<0.005	NA	NA	0.6
FPA-B41-SS-1	9/22/1992	4.0-5.0	<0.025	<0.025	<0.025	<0.025	2

SECTION 3

RISK DETERMINATION

The soil contamination at the site was evaluated in accordance with ORBCA Tier 1/1A guidelines. Risk-based screening levels (RBSLs) for exposure to contaminants in soils were developed for current on-site workers (commercial workers in and around Bldg. 2111 and construction workers that may be on-site for utility line maintenance). Based on distance, accessibility and planned future use of the facility, both the current/future resident child/adult use was considered as incomplete pathways. Although the RBSL was exceeded for benzene for the commercial worker (indoor inhalation of surface soils pathway), only 1 benzene sample (collected in 1993 near the former asphalt pad) actually exceeded the Tier1/1A screening level. The benzene level was 0.017 mg/kg, while the RBSL was 0.013 mg/kg. Furthermore, there were only 2 detections of benzene throughout the 5 years of sampling at the site. Though high levels of TPH still exist in the soils no nuisance conditions were observed. Based on the RBSL results, closure was a recognized option for the soils at the site under Tier 1/1-A. However, removal of potential free product in the soils near identified release areas was required by the OCC regulations. Therefore, bioventing was initiated at the areas with the fuel saturated soils. Complete descriptions of the potential pathways and receptors are presented in the ORBCA report for this site (Parsons ES, 1997).

SECTION 4

NO FURTHER ACTION

The risk to human health and the environment at the site s low. Therefore, based on the analytical results, the no-further-action alternative is proposed for this site having achieved satisfactory cleanup levels. Bioventing results after the first year of operation indicate that the former fuel storage tanks area at the south end of the site and the hydrant stands at the edge of the flight line tarmac do not require further treatment. Based on the OCCs closure notification on October 13, 1999, cleanup activities near the central defueling pad and the active USTs are considered adequate. Therefore, all treatment will be terminated and surface equipment will be decommissioned and removed from the site. Vapor monitoring and air injection wells will be abandoned in accordance with the requirements of the Oklahoma Water Resources Board. No evidence suggests that the groundwater, surface water, soil or air is sufficiently contaminated by this UST site to pose any threat to human health or the environment. Current site conditions and environmental testing data indicate that no-further-action is warranted at the Fuel Purge Area. Additionally, the secured nature of the site and the limited exposure pathways support this alternative.

The groundwater in the USZ, and the underlying zones, remains under the regulatory jurisdiction and enforcement of the ODEQ. The groundwater beneath this site is part of an IRP GWMU and is being addressed under RCRA requirements. The monitoring wells installed during the Fuel Purge Area investigation will continue to be used for groundwater monitoring in this area of the GWMU. Any further actions associated with the GWMU will be coordinated through the ODEQ.

SECTION 5

REFERENCES

Burke Engineers, Inc., A.L., July 1986, Investigation of Underground Storage Tanks, Tinker Air Force Base, Oklahoma.

IT Corporation, September 1999, Basewide Non-NPL Groundwater Phase II RCRA Facility Investigation for Appendix I and II SWMUs, Addendum 1, Volume 1-3, Tinker Air Force Base, Oklahoma.

Parsons ES, January 1993, Underground Fuel Storage Tanks Preliminary Design Report, Tinker Air Force Base, Oklahoma.

Parsons ES, May 1997, Oklahoma Risk-Based Corrective Action Tier 1/1A Summary Report for Fuel Purge Area at Tinker Air Force Base, Oklahoma.

Parsons ES, July 1997, *Final* Remedial Action Plan for the Fuel Pure Area, Tinker Air Force Base, Oklahoma.

Parsons ES, April 1999, *Revision 1*, Site Investigation Workplan for the Southeast Quadrant Wastewater Collection System, at Tinker Air Force Base, Oklahoma.

Tetra Tech, June 1994, Initial Site Characterization Report of UST Site 33, Tinker Air Force Base, Oklahoma.

Tetra Tech, July 1996, UST Hydrant System Investigation for Soil and Groundwater Cleanup Report for UST Site 33, Tinker Air Force Base, Oklahoma.

USDA, 1996, *Draft-Preliminry* Revised Soil Maps and Soil Designations Altas Sheet #25 for Oklahoma County, Oklahoma.

Woodward-Clyde, February 1994, Final Report for Phase I RCRA Facility Investigation of Waste Fuel Dump Site, Tinker Air Force Base, Oklahoma City, Oklahoma.

Woodward-Clyde, May 1996. Final Report for Phase II Site Investigation of Waste Fuel Dump Site, Tinker Air Force Base, Oklahoma City, Oklahoma.

APPENDIX A

CLOSURE NOTICE

OKLAHOMA CORPORATION COMMISSION
PETROLEUM STORAGE TANK DIVISION
(405) 521-4683 FAX: (405) 521-4945

JIM THORPE BLDG, ROOM 238 • P.O. BOX 52000-2000 • OKLAHOMA CITY, OKLAHOMA 73152-2000

October 13, 1999

Case ID #064-1105
Facility ID #55-08120

CERTIFIED MAIL, RETURN RECEIPT REQUESTED
CERTIFICATE NUMBER Z 228 414 392

OC-ALC/EMR
Attn: Ms. Cathy Scheirman, Chief
7701 2nd Street, Suite 204
Tinker AFB, OK 73145-9100

RE: Final Closure for site located at:

Fuel Purge Area
Bldg. 2111 Area
Tinker AFB, OK

Dear Ms. Scheirman:

Based upon the review of the Oklahoma Risk-Based Corrective Action Report, this case is closed. If in the future, levels of Chemicals of Concern are discovered to exceed those determined appropriate for this site, the case will be reopened. A copy of this letter is being sent to your consultant.

If you have any questions, please discuss them with your consultant or call Joseph Lopez at (405) 522-1446 between 8:00 a.m. and 4:30 p.m. Monday through Friday. Please reference the appropriate OCC Facility Number and Case Number on all correspondence.

Sincerely,

Neil R. Garrett

Neil R. Garrett
Project Environmental Analyst Supervisor

cc: Parsons Engineering Science
Attn: Mr. John Osweiler
5600 Liberty Parkway, Suite 700-C
Midwest City, OK 73110

NG/JEL:la

NOTE: The applicable Corporation Commission rule is found in the Oklahoma Administrative Code at 165:25-3-79. If you need a copy, please call us and we will send you one.